

SUMMARY DATA FOR CASE 1B

This section contains the following economic data for case 1B:

- Capital Investment and Revenue Requirement Summary
- Total Plant Cost

CAPITAL INVESTMENT & REVENUE REQUIREMENT SUMMARY**TITLE/DEFINITION**

Case:	Natural Gas Combined Cycle-1x1"H" w/ CO ₂		
Plant Size:	310.8 (MW,net)	HeatRate:	7,879 (Btu/kWh)
Primary/Secondary Fuel(type):	Natural Gas	Cost:	2.70 (\$/MMBtu)
Design/Construction:	2.5 (years)	BookLife:	20 (years)
TPC(Plant Cost) Year:	1999 (Dec.)	TPI Year:	2000 (Jan.)
Capacity Factor:	65 (%)	CO ₂ Removed	736,576 (tons/year)

CAPITAL INVESTMENT

	\$x1000	\$/kW
Process Capital & Facilities	230,329	741.0
Engineering(incl.C.M.,H.O.& Fee)	13,820	44.5
Process Contingency	11,262	36.2
Project Contingency	37,555	120.8

TOTAL PLANT COST(TPC)	\$292,966	942.6
TOTAL CASH EXPENDED	\$292,966	
AFDC	\$15,614	
TOTAL PLANT INVESTMENT(TPI)	\$308,580	992.8

Royalty Allowance		
Preproduction Costs	8,772	28.2
Inventory Capital	1,280	4.1
Initial Catalyst & Chemicals(w/equip.)		
Land Cost	164	0.5
TOTAL CAPITAL REQUIREMENT(TCR)	\$318,796	1025.7

OPERATING & MAINTENANCE COSTS (2000 Dollars)

	\$x1000	\$/kW-yr
Operating Labor	2,064	6.6
Maintenance Labor	2,338	7.5
Maintenance Material	3,508	11.3
Administrative & Support Labor	1,100	3.5

TOTAL OPERATION & MAINTENANCE	\$9,010	29.0
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FIXED O & M	17.70 \$/kW-yr
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VARIABLE O & M	0.20 ¢/kWh
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CONSUMABLE OPERATING COSTS,less Fuel (2000 Dollars)

	\$x1000	¢/kWh
Water	228	0.01
Chemicals	4,786	0.27
Other Consumables		
Waste Disposal		

TOTAL CONSUMABLE OPERATING COSTS	\$5,014	0.28
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BY-PRODUCT CREDITS (2000 Dollars)

FUEL COST (2000 Dollars)	\$37,649	2.13
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Levelized (Over Book Life \$)**PRODUCTION COST SUMMARY**

	\$/ton CO₂	¢/kWh
Fixed O & M	\$2.91	17.7/kW-yr
Variable O & M	\$2.12	0.31
Consumables	\$6.27	0.20
By-product Credit		0.28
Fuel	\$9.82	2.13
TOTAL PRODUCTION COST	\$21.12	2.92

LEVELIZED CARRYING CHARGES(Capital)	\$28.31	141.5/kW-yr
		2.49

LEVELIZED (Over Book Life) BUSBAR COST OF POWER	\$49.43	5.41
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ESTIMATE BASIS/FINANCIAL CRITERIA for REVENUE REQUIREMENT CALCULATIONS			
GENERAL DATA/CHARACTERISTICS			
Case Title:	Natural Gas Combined Cycle-1x1"H" w/ CO ₂		
Unit Size:/Plant Size:	310.8 MW _{net}	310.8 MWe	
Location:	East-West Region		
Fuel: Primary/Secondary	Natural Gas		
Energy From Primary/Secondary Fuels	7,879 Btu/kWh	Btu/kWh	
Levelized Capacity Factor / Preproduction(equivalent months)	65 %	1 months	
Capital Cost Year Dollars (Reference Year Dollars):	1999 (December)		
Delivered Cost of Primary/Secondary Fuel	2.70 \$/MBtu	\$/MBtu	
Design/Construction Period:	2.5 years		
Plant Startup Date (1st. Year Dollars):	2000 (January)		
Land Area/Unit Cost	100 acre	\$1,644 /acre	
FINANCIAL CRITERIA			
Project Book Life:	20 years		
Book Salvage Value:	%		
Project Tax Life:	20 years		
Tax Depreciation Method:	Accel. based on ACRS Class		
Property Tax Rate:	1.0 % per year		
Insurance Tax Rate:	1.0 % per year		
Federal Income Tax Rate:	34.0 %		
State Income Tax Rate:	%		
Investment Tax Credit/% Eligible	%	%	
Economic Basis:	Over Book Lif Constant Dollars		
Capital Structure	% of Total	Cost(%)	
Common Equity	45	12.00	
Preferred Stock	10	8.50	
Debt	45	9.00	
Weighted Cost of Capital:(after tax)	8.76 %		
	Over Book Life	1999 to 2000	
Escalation Rates	General	% per year	% per year
	Primary Fuel	% per year	% per year
	Secondary Fuel	% per year	% per year

Client: Project:		EPR/DOE VISION 21 INNOVATIVE POWER CYCLES		Report Date: 12-Jul-2000 11:12 AM					
Case: Plant Size:		TOTAL PLANT COST SUMMARY		Cost Base (Dec) 1999 (\$x1000)					
		Natural Gas Combined Cycle-1x1"H" w/ CO ₂ 310.8 MW/net		Estimate Type: Conceptual					
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor Direct Indirect	Sales Tax	Bare Erected Cost \$	Eng'g CM H.O.& Fee	Contingencies Process Project	TOTAL PLANT COST \$ \$/kW
1	COAL & SORBENT HANDLING								
2	COAL & SORBENT PREP & FEED								
3	FEEDWATER & MISC. BOP SYSTEMS	3,295	2,802	4,498	315	\$10,910	655	2,700	\$14,264 46
4	GASIFIER & ACCESSORIES								
4.1	Gasifier & Auxiliaries								
4.2	High Temperature Cooling								
4.3	Recycle Gas System								
4.4-4.9	Other Gasification Equipment SUBTOTAL 4								
5A	GAS CLEANUP & PIPING								
5B	CO. REMOVAL & COMPRESSION	48,482		34,151	2,391	\$85,024	5,101	6,089	\$110,647 356
6	COMBUSTION TURBINE/ACCESSORIES								
6.1	Combustion Turbine Generator	47,902	320	3,570	250	\$51,722	3,103	5,172	\$65,997 212
6.2-6.9	Combustion Turbine Accessories SUBTOTAL 6	47,902	320	529 4,099	37 287	\$886 \$52,608	53 3,156	282 5,172	\$1,221 \$67,218 216
7	HRSG, DUCTING & STACK								
7.1	Heat Recovery Steam Generator	13,934		5,724	401	\$20,058	1,204	2,126	\$23,388 75
7.2-7.9	HRSG Accessories, Ductwork and Stack SUBTOTAL 7	13,934	268	384 6,108	27 428	\$678 \$20,737	41 1,244	216 2,342	\$935 \$24,323 78
8	STEAM TURBINE GENERATOR								
8.1	Steam TG & Accessories	8,583		1,880	132	\$10,594	636	1,123	\$12,353 40
8.2-8.9	Turbine Plant Auxiliaries and Steam Piping SUBTOTAL 8	2,789 11,372	256 256	3,080 4,960	216 347	\$6,341 \$16,936	380 1,016	1,194 2,317	\$7,916 \$20,269 65
9	COOLING WATER SYSTEM	2,474	1,996	3,336	233	\$8,040	482	1,692	\$10,214 33
10	ASH/SPENT SORBENT HANDLING SYS								
11	ACCESSORY ELECTRIC PLANT	4,481	3,337	11,337	794	\$19,948	1,197	3,745	\$24,891 80
12	INSTRUMENTATION & CONTROL	1,861	234	2,276	159	\$4,531	272	653	\$5,456 18
13	IMPROVEMENTS TO SITE	1,073	583	4,063	284	\$6,003	360	1,909	\$8,272 27
14	BUILDINGS & STRUCTURES		2,073	3,291	230	\$5,594	336	1,482	\$7,412 24
TOTAL COST		\$134,874	\$11,869	\$78,118	\$5,468	\$230,329	\$13,820	\$11,262	\$37,555 943

Client: EPRI/DOE VISION 21		Report Date: 12-Jul-2000										
Project: INNOVATIVE POWER CYCLES		11:12 AM										
Case: Natural Gas Combined Cycle-1x1"H" w/ CO ₂		Cost Base (Dec) 1999 (\$x1000)										
Plant Size: 310.8 MW _{net}		Estimate Type: Conceptual										
TOTAL PLANT COST SUMMARY												
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor Direct	Labor Indirect	Sales Tax	Bare Erected Cost \$	Eng'g CM H.O.& Fee	Contingencies Process	Project	TOTAL PLANT COST \$	\$/kW
1	COAL & SORBENT HANDLING											
1.1	Coal Receive & Unload											
1.2	Coal Stackout & Reclaim											
1.3	Coal Conveyors & Yd Crush											
1.4	Other Coal Handling											
1.5	Sorbent Receive & Unload											
1.6	Sorbent Stackout,Storage & Reclaim											
1.7	Sorbent Conveyors											
1.8	Other Sorbent Handling											
1.9	Coal & Sorbent Hnd.Foundations											
	SUBTOTAL 1.											
2	COAL & SORBENT PREP & FEED											
2.1	Coal Crushing & Drying											
2.2	Prepared Coal Storage & Feed											
2.3	Coal & Sorbent Feed System											
2.4	Misc.Coal Prep & Feed											
2.5	Sorbent Prep Equipment											
2.6	Sorbent Storage & Feed											
2.7	Sorbent Injection System											
2.8	Booster Air Supply System											
2.9	Coal & Sorbent Feed Foundation											
	SUBTOTAL 2.											
3	FEEDWATER & MISC. BOP SYSTEMS											
3.1	FeedwaterSystem	909	1,767	1,382	97		\$4,155	249	881		\$5,286	17
3.2	Water Makeup & Pretreating	203	21	170	12		\$406	24	129		\$560	2
3.3	Other Feedwater Subsystems	509	190	254	18		\$971	58	206		\$1,235	4
3.4	Service Water Systems	114	242	1,246	87		\$1,690	101	537		\$2,328	7
3.5	Other Boiler Plant Systems	606	245	449	31		\$1,332	80	282		\$1,694	5
3.6	FO Supply Sys & Nat Gas	141	267	368	26		\$802	48	170		\$1,020	3
3.7	Waste Treatment Equipment	305	69	260	18		\$583	35	186		\$804	3
3.8	Misc. Power Plant Equipment	508	69	368	26		\$970	58	308		\$1,336	4
	SUBTOTAL 3.	\$3,295	\$2,802	\$4,498	\$315		\$10,910	\$655	\$2,700		\$14,264	46
4	GASIFIER & ACCESSORIES											
4.1	Gasifier & Auxiliaries											
4.2	High Temperature Cooling											
4.3	Recycle Gas System											
4.4	Booster Air Compression											
4.5	Misc. Gasification Equipment											
4.6	Other Gasification Equipment											
4.8	Major Component Rigging											
4.9	Gasification Foundations											
	SUBTOTAL 4.											
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Client: EPR/DOE VISION 21		Report Date: 12-Jul-2000										
Project: INNOVATIVE POWER CYCLES		11:12 AM										
Case: Natural Gas Combined Cycle-1x1"H" w/ CO ₂		Cost Base (Dec) 1999 (\$x1000)										
Plant Size: 310.8 MW.net		Estimate Type: Conceptual										
TOTAL PLANT COST SUMMARY												
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor		Sales Tax	Bare Erected Cost \$	Eng'g CM H.O.& Fee	Contingencies		TOTAL PLANT COST \$	\$/KW
				Direct	Indirect				Process	Project		
5A	GAS CLEANUP & PIPING											
	5A.1 Gas Desulfurization(Trans.Reactor)											
	5A.2 Sulfur Recovery (Sulfator Sys.)											
	5A.3 Chloride Guard											
	5A.4 Particulate Removal											
	5A.5 Blowback Gas Systems											
	5A.6 Fuel Gas Piping											
	5A.9 HGPU Foundations											
	SUBTOTAL 5A											
5B	CO ₂ REMOVAL & COMPRESSION											
	5B.1 CO ₂ Removal System	32,626		26,418	1,849		\$60,893	3,654	6,089	10,595	\$81,232	261
	5B.2 CO ₂ Compression & Drying	15,856		7,733	541		\$24,131	1,448		3,837	\$29,415	95
	SUBTOTAL 5B	\$48,482		\$34,151	\$2,391		\$85,024	\$5,101	\$6,089	\$14,432	\$110,647	356
6	COMBUSTION TURBINE/ACCESSORIES											
	6.1 Combustion Turbine Generator	47,902		3,570	250		\$51,722	3,103	5,172	6,000	\$65,997	212
	6.2 Combustion Turbine Accessories											
	6.3 Compressed Air Piping											
	6.9 Combustion Turbine Foundations											
	SUBTOTAL 6	\$47,902		\$4,099	\$287		\$52,608	\$3,156	\$5,172	\$6,281	\$67,218	216
7	HRSG, DUCTING & STACK											
	7.1 Heat Recovery Steam Generator	13,934		5,724	401		\$20,058	1,204		2,126	\$23,388	75
	7.2 HRSG Accessories											
	7.3 Ductwork											
	7.4 Stack											
	7.9 HRSG,Duct & Stack Foundations											
	SUBTOTAL 7	\$13,934		\$6,108	\$428		\$20,737	\$1,244		\$2,342	\$24,323	78
8	STEAM TURBINE GENERATOR											
	8.1 Steam TG & Accessories	8,583		1,880	132		\$10,594	636		1,123	\$12,353	40
	8.2 Turbine Plant Auxiliaries	56		190	13		\$260	16		28	\$303	1
	8.3 Condenser & Auxiliaries	1,504		610	43		\$2,156	129		229	\$2,514	8
	8.4 Steam Piping	1,230		1,583	111		\$2,924	175		620	\$3,719	12
	8.9 TG Foundations											
	SUBTOTAL 8	\$11,372		\$4,960	\$347		\$16,936	\$1,016		\$2,317	\$20,269	65
9	COOLING WATER SYSTEM											
	9.1 Cooling Towers	1,162		378	26		\$1,567	94		166	\$1,827	6
	9.2 Circulating Water Pumps	293		41	3		\$338	20		36	\$394	1
	9.3 Circ.Water System Auxiliaries	92		19	1		\$113	7		12	\$131	0
	9.4 Circ.Water Piping											
	9.5 Make-up Water System	820		559	39		\$1,955	117		414	\$2,487	8
	9.6 Component Cooling Water Sys	107		900	63		\$1,783	107		378	\$2,268	7
	9.9 Circ.Water System Foundations											
	SUBTOTAL 9	\$2,474		\$1,996	\$233		\$5,040	\$482		\$1,692	\$10,214	33

Client: EPRIDOE VISION 21		Report Date: 12-Jul-2000										
Project: INNOVATIVE POWER CYCLES		11:12 AM										
Case: Natural Gas Combined Cycle-1x1"H w/ CO ₂												
Plant Size: 310.8 MW/net												
Estimate Type: Conceptual												
Cost Base (Dec) 1999 (\$x1000)												
TOTAL PLANT COST SUMMARY												
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor Direct	Labor Indirect	Sales Tax	Bare Erected Cost \$	Eng'g CM H.O. & Fee	Contingencies Process	Contingencies Project	TOTAL PLANT COST \$	TOTAL PLANT COST \$/kW
10	ASH/SPENT SORBENT HANDLING SYS											
10.1	Gasifier Ash Removal											
10.2	Gasifier Ash Depressurization											
10.3	Cleanup Ash Depressurization											
10.4	High Temperature Ash Piping											
10.5	Other Ash Recovery Equipment											
10.6	Ash Storage Silos											
10.7	Ash Transport & Feed Equipment											
10.8	Misc. Ash Handling Equipment											
10.9	Ash/Spent Sorbent Foundation											
	SUBTOTAL 10.											
11	ACCESSORY ELECTRIC PLANT											
11.1	Generator Equipment	436		570	40		\$1,046	63		111	\$1,219	4
11.2	Station Service Equipment	808		96	7		\$911	55		97	\$1,062	3
11.3	Switchgear & Motor Control	996		239	17		\$1,252	75		199	\$1,526	5
11.4	Conduit & Cable Tray		1,334	6,054	424		\$7,813	469		1,656	\$9,938	32
11.5	Wire & Cable		1,596	2,304	161		\$4,061	244		861	\$5,165	17
11.6	Protective Equipment		349	1,681	118		\$2,148	129		342	\$2,618	8
11.7	Standby Equipment	65		83	6		\$154	9		24	\$188	1
11.8	Main Power Transformers	2,177		80	6		\$2,263	136		360	\$2,758	9
11.9	Electrical Foundations		58	229	16		\$302	18		96	\$417	1
	SUBTOTAL 11.	\$4,481	\$3,337	\$11,337	\$794		\$19,948	\$1,197		\$3,745	\$24,891	80
12	INSTRUMENTATION & CONTROL											
12.1	IGCC Control Equipment											
12.2	Combustion Turbine Control											
12.3	Steam Turbine Control											
12.4	Other Major Component Control											
12.5	Signal Processing Equipment											
12.6	Control Boards, Panels & Racks											
12.7	Computer & Accessories											
12.8	Instrument Wiring & Tubing											
12.9	Other I & C Equipment											
	SUBTOTAL 12.											
13	IMPROVEMENTS TO SITE											
13.1	Site Preparation											
13.2	Site Improvements											
13.3	Site Facilities											
	SUBTOTAL 13.											
14	BUILDINGS & STRUCTURES											
14.1	Combustion Turbine Area											
14.2	Steam Turbine Building											
14.3	Administration Building											
14.4	Circulation Water Pump House											
14.5	Water Treatment Buildings											
14.6	Machine Shop											
14.7	Warehouse											
14.8	Other Buildings & Structures											
14.9	Waste Treating Building & Str.											
	SUBTOTAL 14.											
	TOTAL COST	\$134,874	\$11,869	\$78,118	\$5,468		\$230,329	\$13,820	\$11,262	\$37,555	\$292,966	943